THE MARINE RECORD

ESTABLISHED 1878

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THE UNITED STATES NAVY.

Secretary of the Navy Herbert, in his annual report, asks congress at the coming session to authorize three light draft battle ships and 12 torpedo boats. He recommends that these ships be planned for an extreme deep load draught of not more than 23 feet, and suggests that considerations of strategy upon our Atlantic and gulf coasts render this an essential success of naval campaigns. This reasoning, he says, is the final result of much careful study by able officers of conditions as they exist on our southern coast. Battle ships that could enter the harbors of Savannah, Brunswick, Key West, Tampa, Pensacola, Mobile and the mouth of the Mississippi at all times would have an immense advantage over the battle ships of foreign nations, few, if any, of which could enter these ports. Light draft battle ships, if we had them, could make any of these ports basis of supply; could sally forth from them or retire into them at will and could, therefore, almost always offer battle on their own terms. There are also many of our ports further north which would give the same advantages to such ships.

An interesting feature of the report in a resumé of the progress of the upbuilding of the new navy from the time of its inauguration under Secretary Chandler. Congress has authorized during the present administration 28 vessels with a total tonnage of 65,866 tons; of these five are first-class battle ships and sixteen torpedo boats. Large as the above increase appears it yet does not suffice to place the United States navy in a satisfactory condition, if we mean to be able at all times to defend our long line of sea coast, afford unquestionable protection to our citizens in foreign lands, render efficient aid to our diplomacy and maintain under circumstances our national honor.

The secretary, calling attention to the comparative naval strength of the principal powers, states that while the results achieved by the United States are highly creditable to the country, yet it is clear that the great powers with which we are brought into close relationship largely exceed us, not only in the number of battle ships and torpedo boats actually in commission, but in their naval programmes for the future.

The secretary shows that on June 30, 1893, there were 30 vessels in commission with a tonnage of 62,820 tons, while on December 10, 1896, the total tonnage in commission will be 137,859 tons.

Attention is again called to the necessity for some legislation by congress which will enable the department to make use in case of an emergency, of the tugs, yachts and vessels engaged in the fishing fleets and the coastwise lake trade, and to call into the service of the navy the sailors and officers necessary to command and fit such ships in case of threatened or actual war. He recommends an additional appropriation for the purpose of supplying guns and ammunition with which to arm vessels to be called into service from our merchant marine.

Reference is also made to a reserve system, and the secretary sets forth the report of a board appointed to formulate a general plan for the laying up of vessels in reserve, and in this connection it is announced that the department expects to be able to submit to congress at an early day during the coming session suggestions for such legislation as may be needed to provide proper accommodation for ships, so that it may establish and maintain a reserve system, with the value and importance of which the department is deeply impressed.

The subject of the naval militia is dealt with at some length, and it is shown that at the close of the last administration the number of naval militia lawfully certified was 1,794, divided among the states of Rhode Island, Maryland, South Carolina, North Carolina, Massachusetts, California and New York. From the last official returns they now number 3,339 in California, New York, Massachusetts, North Carolina, Rhode Island, Maryland, South Carolina, Pennsylvania, Illionis, Connecticut, Michigan, New Jersey, Georgia and Louisiana, and the department has been informed of the prospective formation of an additional battalion in New York (at Brooklyn) and an organization in Ohio.

During the summer the various battalions have been drilled on vessels of the navy and have had the advantages of target practice and drills with the batteries of the ships.

The secretary devotes considerable space to reviewing the reports of the chiefs of bureaus, and in this connection asks congress to authorize the building of a dock at Norfolk, Va., of sufficient size to take in the largest vessel of the navy. This he recommends should be constructed of concrete, as it is more durable, more readily repaired and cheaper than a wooden dock.

A NEW ORIENTAL TRANS-PACIFIC LINE.

The much discussed steamship line from Japan to a Southern California port, which Japanese capital is said to have been toying with for some months, will be owned by Americans. The press dispatches from Chicago stated that E. C. Potter, son of O. W. Potter, the noted financier, is working on the establishment of such a steamship line.

Secretary Willard, of the Los Angeles Chamber of Commerce, states that the news is correct and that the enterprise is in a fair way to be successful. Mr. Potter has been in Southern California for some time. The project is backed by himself in conjunction with the larger holders of Sante Fe securities, and the Cramps, ship builders at Philadelphia. The project will not be officially connected with the Sante Fe Railroad, but will be in full sympathy with that corporation. The capital stock will probably be $10,000,000, and pledges for a large portion have already been made. The presence of Mr. Potter in Southern California is due to his desire to ascertain what interest capitalists and merchants will take in the enterprise, and the responses have been very satisfactory. The Chamber of Commerce at Los Angeles has taken the matter in hand, and is pushing forward with zeal.

The plan is to have built the finest passenger steamers of the day, costing $1,500,000 each, to be 8,000 tons burden, in all particulars to excel the best of the P. & O. vessels. The projectors figure that East Indian travelers to England will save at least three days' time as against these routes. The time on freight will also be materially reduced. and rates considerably reduced. The whole enterprise is based on the lines of magnificence and the greatest possible speed, with the expectation of depriving the Canadian Pacific of its trade and the English P. & O. steamers of a good proportion of theirs. The service is to be semi-monthly at least. The port has not been selected, but it is likely to be San Diego, until San Pedro is made a deep water harbor.

HELICAL DRAFT—SERVE TUBES.

John Brown & Co., Limited, of Sheffield, England, have just issued a general description of Eaves' helical induced draught in conjunction with Serve tubes as applied to marine boilers. By this induced draught the boiler is thoroughly enveloped by the escaping heat, thus effectually preventing either "radiation," "condensation," or straining to the boiler. Experiments have been made with this draft with results varying from 78 to 82 per cent. of efficiency, and a coal consumption of from 30 to 35 pounds per square foot of grate. It is claimed that two boilers with natural draft would be required to do the work of one of the same size fitted with helical draught and Serve tubes, the relative efficiencies being as 65 is to 80. The sole American agent for John Brown & Co. is Mr. Charles W. Whitney, 64, 66, 68 Broadway, New York.

DISCRIMINATION.

After the annual report of the commissioner of navigation was sent to the printer, the President issued his proclamation, dated December 3, 1896, which resumes after January 2, 1897, the imposition of tonnage taxes on vessels entering the United States from German ports. The suspension of these taxes was authorized by the President in a proclamation issued January 26, 1888, pursuant to section 11 of the act of June 19, 1886. During the current calendar year the state department, at the request of this bureau, transmitted through the honorable the secretary of the treasury, has made an investigation into the charges imposed on American vessels in German ports. This investigation has developed the fact that while the German imperial government imposes no taxes on American shipping, it nevertheless allows the German maritime states to tax American ships for the general purposes of river and harbor improvements and maintenance of the light-house service. In brief, it has been shown that the German government has availed itself of a difference between the constitution of the United States and the German imperial constitution to obtain an advantage over the United States in the matter of reciprocal exemptions from tonnage and light-house dues on shipping. Under the German imperial constitution such charges are relegated to the maritime states. Under the constitution of the United States the states are forbidden to levy such charges which are relegated to the federal government. The German government for some years has taken advantage of this different distribution of power to tax shipping, and held that so long as its imperial authority deprived constitutionally of the right to levy taxes on shipping, except discriminating taxes, has not exercised a forbidden power; that, therefore, the federal government of the United States, alone empowered by the constitution to impose tonnage dues, cannot exercise that power under the act of 1886, in the case of vessels entering from Germany. The government of the United States has declined to accept this strained construction of the act of 1886, and holds that tonnage taxes and light-house dues levied for the benefit of the harbor of Hamburg and to light the entrance to the harbor of Bremen, are equivalent taxes to our tonnage taxes. While not directly involved, the fact may be mentioned that the President's proclamation will remove a discrimination against our only transatlantic steamship line, and will add about $65,000 annually to the income of the Marine Hospital, as estimated by this bureau, or $80,000, as estimated by agents of the steamship lines concerned.

LIGHT DRAFT RIVER STEAMER

Lewis Nixon, of the Crescent Ship Building Works, at Elizabethport, N. J., has ready for shipment in separate pieces a steamer for South America. The vessel is to be used on the Magdalena river in Colombia. Her length is 100 feet, beam 22 feet, depth 7 feet, and she carries 100 tons of cargo on 3-foot draught. She is propelled by independent side-wheels, driven by compound engines. Her speed will be 11 miles an hour.

A TRANS-CONTINENTAL SHIPMENT.

Joseph U. Crawford, recently appointed representative of the Imperial railroads of Japan, for the purchase of 15,000 tons of steel rails and fastenings from the Carnegie Steel Co., Pittsburg, Pa., reports that shipments of the material are being made to Yokohama. A contract with the Carnegie Co., closed by the Great Northern, to ship 6,500 tons of the rails and fastenings from Pittsburg to Yokohama, the shipment going up to the close of navigation via Cleveland, Northern Steamship Co., Great Northern Railroad from Duluth, and its steamship line, the Nippon Yusen Kaisha, from Seattle to Yokohama.

F. W. WHEELER & CO.'S WORK.

The Pere Marquette, built at the yards of F. W. Wheeler & Co., West Bay City, Mich., is probably the strongest car ferry steamer ever built in the United States. Her length between perpendiculars is 331 feet, over all 350 feet, beam 56 feet, depth below main deck 19 feet 6 inches. The channels are spaced twenty-four inches amidship and fourteen inches forward. Channel beams braced vertically and horizontally span the hull at close intervals midway between the floor and main deck, to resist the crushing pressure of ice-shovels during the winters. The hull has six water-tight bulkheads for safety in case of collision. If any two of the compartments should fill with water the steamer would still be able to carry her cargo. The forward plating is three-quarters inch and double for a distance of sixty feet back of the stem. The plating is also doubled on the between deck beam strake. The keelsons are close and extra heavy, and in the forward compartments they are almost solid. About 2,700 tons of plates and angles entered into the construction of her hull, and steel rivets were used for fastenings. The model of the hull has gained the admiration of all who visited the Wheeler yard during the time it was approaching completion.

The engines of the steamer are two in number and of fore-and-aft compound pattern, with 27 and 56-inch cylinders and 36-inch stroke. They will turn twinscrews 11 feet in diameter. The shafting tubes for the wheels are constructed as a portion of the hull and carry an inside cast steel tube in which the shafts run. Steam will be furnished by four boilers, each 13 feet 3 inches in diameter and 12 feet long, and allowed a working pressure of 130 pounds to the square inch. Like all modern steamers, the Pere Marquette is supplied with steam steering gear, steam windlass and capstans. She also carried a 16-inch lens search-light.

The Pere Marquette will carry thirty loaded cars and 200 tons of coal on the draught of 14 feet of water, and has a gross tonnage of 5,580. The builder's contract contains a guarantee of twelve and one-half miles per hour average speed, but she will be able to cover fifteen miles per hour easily. Unlike the Ann Arbor and Shenango car ferries the Pere Marquette carries two pole spars, but like them her smokestacks are placed fore and aft.

Mr. Robert Logan, marine architect and consulting engineer of Cleveland, designed and superintended the construction for the owners of the Pere Marquette, and much credit is due Mr. Logan for the superior construction noted in the foregoing.

A CONSOLIDATION.

President S. S. Curry, of the Metropolitan Land and Iron Company, has issued a circular announcing the appointment of Pickands, Mather & Co. as general agents for the handling and sale of ore produced by the Norris and Pabst mines. Mr. E. C. Pope formerly represented the Metropolitan Company in the capacity in which Pickands, Mather & Co. will now act.

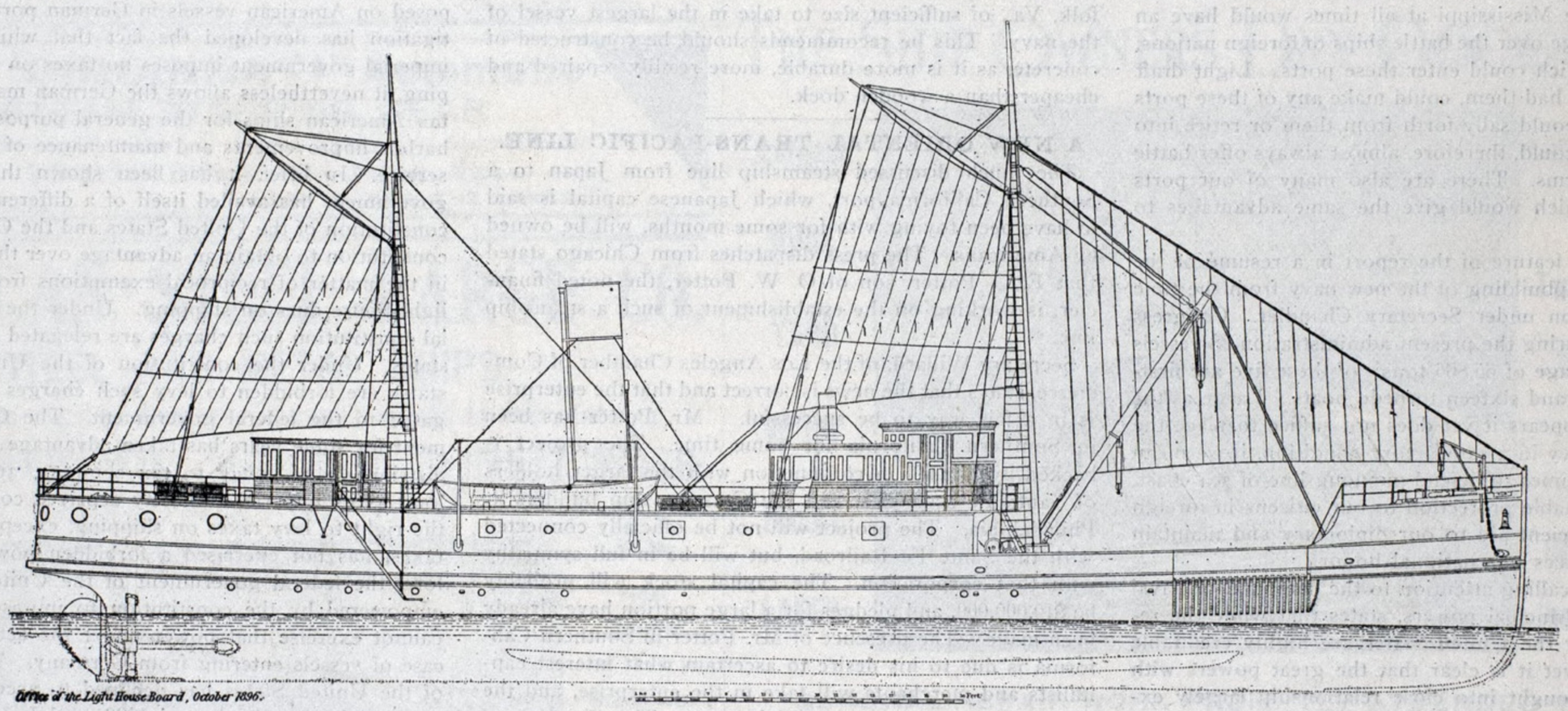
The above named mines can turn out 1,000,000 tons of ore annually, although during the season of 1896 the amount of ore produced was only about **375,000 tons.** Pickands, Mather & Co. operate forty-six vessels, including the American Steel Barge Co. fleet, the Interlake fleet and the Huron Barge Co.'s vessels. The American Steel Barge Company will build another barge during the winter. One reason why Pickands, Mather & Co. were selected to represent the Metropolitan Company was because of the facilities which the firm possesses.

TWIN SCREW LIGHT-HOUSE TENDERS.

As announced and advertised in these columns, the U. S. Light-House Board will have built two twin-screw light-house tenders, bids for which are to be opened on the 30th inst., and the construction to be complete within ten months from date of awarding contract.

The appropriation calls for $75,000, to be expended on each tender, and at that figure a very complete little steamer can now be turned out. The dimensions of the sister boats are to be 164 feet over all, 155 feet between perpendiculars, 30 feet molded beam, and 11 feet 10 inches depth, with five water-tight bulkheads. Engines—twin inverted surface, condensing diameter of cylinder 26 inches, with a stroke of 30 inches. Boilers—two multitubular straight-flued marine, 9 feet diameter and 17 feet in length; to have two Fox corrugated furnaces of 42 inches mean diameter. The twin propellers are to be 7 feet in diameter.

These tenders will be named the Mangrove and Mayflower, one to be stationed at Boston and the other at Key West, Fla. If built on the lakes they are to be delivered on the Atlantic coast. We further note that they will be built according to the rules of the American Shipmasters' Association, of New York, reference to which is frequently used throughout the plans and specifications.



Office of the Light House Board, October 1896.

PLAN OF THE TWO NEW LIGHT-HOUSE TENDERS.

NOTICE OF CHANGE OF LAW

REGARDING THE ISSUE OF STEAMBOAT OFFICERS' LICENSES.

Treasury Department,
Steamboat-Inspection Service. Office of the Supervising Inspector-General.
Washington, D. C., December 8, 1896.

To Supervising and Local Inspectors of Steam Vessels, and others whom it may concern:

An act of Congress approved May 28, 1896, chapter 255, First session, Fifty-fourth Congress, authorizes licenses to officers of steam vessels to be issued, after January 1, 1897, for a term of five years instead of one year as heretofore.

Inspectors will, therefore, after the date indicated, in issuing original, or renewing old licenses, issue them for the term of five years.

New licenses for the purpose are being prepared, and will be furnished inspectors, it is hoped, in time to begin their use on the 2d of January, 1897. In case, however, the new license books should fail to reach any board of local inspectors by the 2d proximo, they will issue licenses from the old books, erasing the word "one" preceding the word "year" where it occurs therein, and interlining the word "five" instead, until such time as they shall receive the new license books.

The act referred to also provides that, after the first day of January, 1897, "no person shall be qualified to hold a license as a commander or watch officer of a merchant vessel of the United States who is not a native-born citizen, or whose naturalization as a citizen shall not have been fully completed." Inspectors will see that the law as here quoted is carried out, by refusing, after January 1, 1897, to issue licenses except to persons qualified as therein stated, and should also demand for cancellation all outstanding licenses held by persons not so qualified.

The act referred to also provides for issuing one renewal of license to licensed officers engaged in service outside the United States, upon receipt of an application in writing from the holder thereof, for such renewal, "verified before a consul, or other officer of the United States authorized to administer an oath, setting forth the reasons for not appearing in person."

Attached hereto will be found the full text of the act above referred to.

JAS. A. DUMONT,
Supervising Inspector-General.

Approved:
W. E. CURTIS,
Acting Secretary.

A SCOTCH BUILT YACHT.

The new steam yacht Varuna, owned by Eugene Higgins, recently arrived at New York from Greenock. She was built on the Clyde by A. & J. Ingliss from designs by G. L. Watson. She is schooner rigged and has two masts with a small yard on the foremast. She is fitted with twin screws, driven by quadruple expansion engines. Her maximum speed is about 17 knots an hour. She is 1,574 tons gross and 595 tons net register. The yacht is fitted with all the latest improvements and appliances. She carries a crew of 61 men, all told. The Varuna had a very rough passage, but proved herself an able sea boat.

A GOOD RECORD.

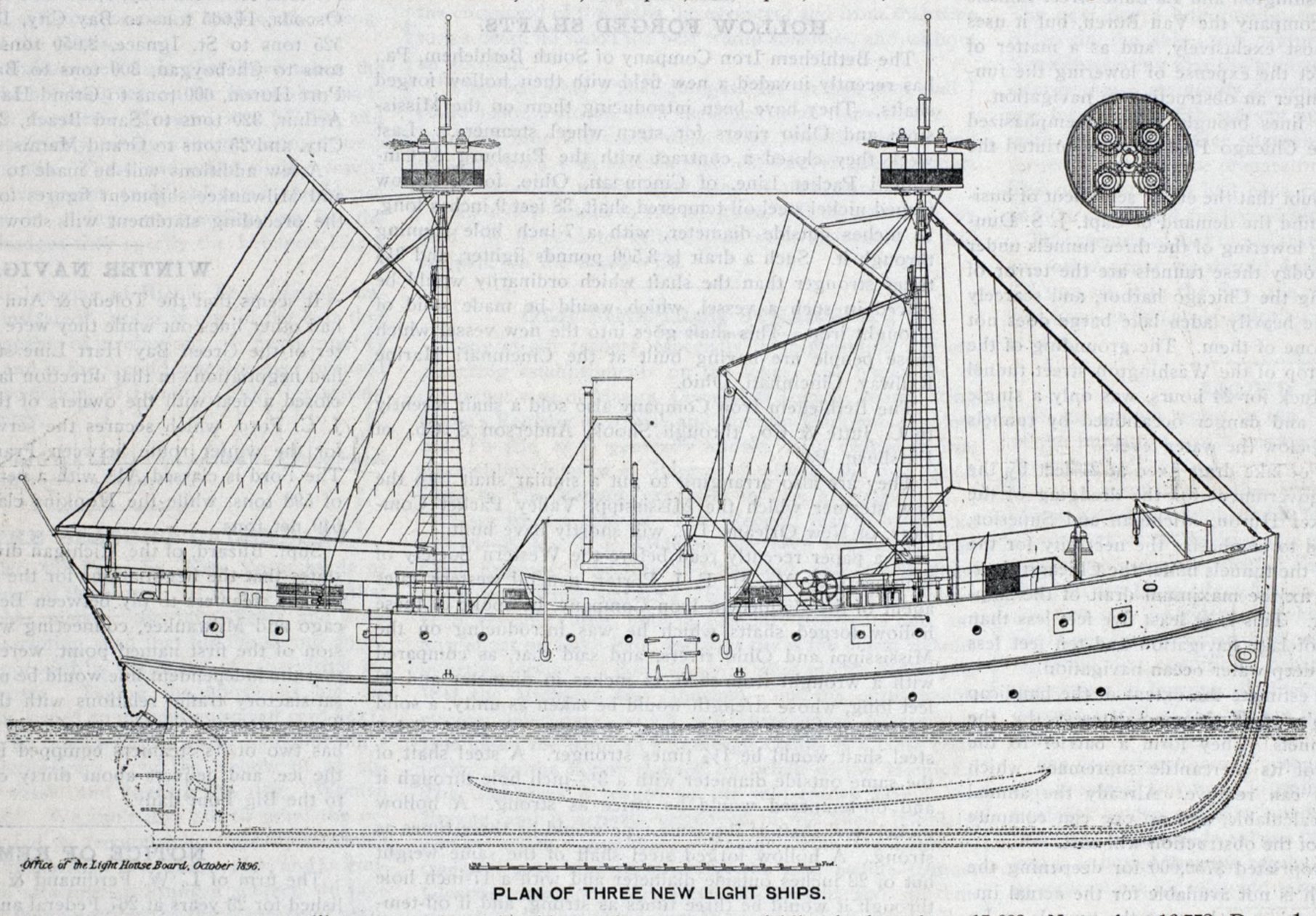
The Goodrich Line passenger steamer Atlanta, Capt. Nicholson, was carried through the past season in a very successful manner and handled by Engineer William Jerome to the entire satisfaction of her owners. The Atlanta made 113 round trips and traveled over a computed distance of 27,000 miles during the season. The Grand Haven Daily News speaks in the highest and most fulsome terms of Capt. Nicholson, who is certainly one of the most favorably known and experienced navigators on Lake Michigan. The chief engineer, William Jerome, is also given a most flattering notice in the same newspaper.

The clerk, J. Fiefield, Steward Hoppersett, Chief Mate O. J. Parker and Milo Mason, the night steward, seem to have gained the respect and good will of the Grand Haven people.

ELECTRIC ICE CRUSHER.

A new plan for reaching the North Pole has just been conceived. That point, surrounded by mystery, is to be reached by means of an electric ice destroyer, attached to the prow of a steam vessel 150 feet long. The originator of the idea is Mr. Warrington Baden-Powell, elder brother of Sir George Baden-Powell, M. P. and Major Baden-Powell, who led the pioneers in the late Ashantee expedition. An expedition is now being planned, but whether it will travel under British or American auspices has not been decided.

The peculiar craft by which it is believed the success for which millions of money have been spent and many lives sacrificed will be achieved, and is to be like nothing ever constructed; in its entirety resembles in a degree the ocean whaleback. The deck covering is of steel, studded with heavy rivets, the whole specially drawn and welded with the idea of withstanding extreme temperature, the sort that is naturally expected to exist in the vicinity of the pole. This is about the only resemblance, so far as any striking feature is concerned, to any other craft which was ever planned. In fact it is noticeable for the many radical changes and departures from all previous theories of marine architecture.



Office of the Light House Board, October 1896.

PLAN OF THREE NEW LIGHT SHIPS.

At the apex of the bow is a curious screw, not unlike a series of circular saws. This ice destroyer, for that is what it really is, constitutes the means for forcing a passage through ice floes, which never could be accomplished continuously and successfully except by some such means. As the ship lies in the water, this screw saw is observed as projecting several feet, and partially out of the water. In appearance this curious contrivance resembles more than anything else, a huge screw. As stated, it has teeth like a saw cut in the edges of its thread. The shaft, or center of this screw, is a massive affair of steel, pointed at one end, so that it may be operated as a ram. It is the idea of the inventor to send the craft ahead at an ice pack or floe under a full head of steam, with the propeller at the stern and the screw at the bow, both working together, although one receives its power from an electric engine, while the power of the other comes from an engine driven by steam. The rapidly revolving screw and ram combined will first crash into the ice impelled by a power that is tremendous, when the size of the craft is considered, then it will saw and bore its way through the pack or floe, throwing the ice upward and backward.

Fire destroyed the publishing house which prints the Marine Record on Thursdays. The paper was put ready to go to press. It will rise from its ashes somewhat behind time, but as good as ever.—Cleveland Leader.

THREE NEW COMPOSITE LIGHT VESSELS.

Besides the two new tenders mentioned on the opposite page, the Light-House Board ask for bids on the construction of three fully equipped light-ships of composite build and chiefly according to the rules of the American Shipmasters' Association.

These vessels are to be placed as follows: San Francisco bar, Diamond Shoals, Cape Hatteras, and at Fire Island entrance to New York bay.

Dimensions.—Length between perpendiculars on sixth water line, 112 feet; beam, molded, 28 feet 6 inches; depth of hold from top of keel to top of spar-deck beam on frame 33, 22 feet 1½ inches. For the construction of these boats a total of $240,000 has been appropriated, which, with the sum granted to build the two tenders, makes an aggregate amount of $390,000, which the Light-House Board will expend on the new contracts.

The frames of these light-vessels are to be of steel with steel plate keel, steel bilge strake, and steel sheer strake; wood planking from the keel up to the sheer line at the main deck, and from that point up to the spar deck to be steel plate. Frames, floors, keelsons, stringers, beams, sheer strake, bilge strake, strapping, keel plate, etc., are to be of steel; stem, sternpost, rudderpost, rudder, false keel, shoe, sheathing, gripe or stern and bilge keels to be of seasoned white oak; keel, planking and dead wood to be of seasoned long-leaf Georgia or Florida pine. Fastenings in plank, keel, and deadwood to be of galvanized iron; in the wood sheathing, composition spikes. The metal sheathing to be 26, 28 and 30-ounce metal, double-punched. The outfit is to include a steam windlass, steam hoister, three anchors, steam heating apparatus and well-arranged quarters for crew that will involve quite an outlay in the general equipment. The main engine will be of the vertical inverted, surface-condensing type, with a single cylinder. All its parts must be proportioned to resist the strains due to a maximum working steam pressure of 100 pounds per square inch and 150 revolutions per minute for any duration of service. The steam cylinder will be 20 inches diameter, with 22 inches stroke of piston. The electric lighting plant, which will include two of the General Electric Co.'s marine sets, with 5 by 4-inch double cylinder General Electric Co. engine, will be an important item of expense in each of these vessels.

The U. S. S. Michigan, now in service on Lake Erie, is 163 feet 3 inches between perpendiculars, 27 feet 1½ inches beam, and of 9 feet mean draft. She was built at Erie, Pa., in 1844 and is an iron paddle-wheel boat, barkentine rigged, 365 h. p., ten and a half knots speed, with a bunker coal carrying capacity of 125 tons.

RIVER POSTAL DELIVERY.

The mail service on Detroit river handled 175,850 pieces of mail during the past season. This service of delivering mail to vessels is a skilled one, requiring great experience and dexterity, and the fact that tens of thousands of letters have been delivered without a mishap shows most creditably for the marine reporters and mail carriers. The following report shows the receipt of letters from the main office, together with telegrams, specials and registered matter, for the season beginning April 16, and ending December 16:

Letters, 137,798; telegrams, 181; specials, 48; registers, 59; total pieces, 138,086.

Receipts from boats aggregated as follows: Letters, 37,303; telegrams, 442; specials, 19; total, 37,764.

The total receipts from both sources by months is given as follows: Letters—April, 3,917; May, 19,508; June, 26,736; July, 28,953; August, 26,973; September, 23,147; October, 22,403; November, 20,951; December, 2,513; total, 175,101; telegrams, 623; specials, 67; registers, 59; total, 175,850 pieces.

Mail was delivered as follows during the season:

Letters—April, 1,600; May, 13,994; June, 19,876; July, 21,639; August, 19,549; September, 17,865; October, 17,693; November, 16,772; December, 2,085; total, 131,073; telegrams, 181; specials, 48; registers, 59; total mail delivered, 131,361 pieces; mail forwarded, 3,776; mail returned, 2,949; total, 6,725 pieces.

Number of vessel passages—Day, 11,215; night, 8,172; total, 19,387; average number of pieces handled for each boat, 9; stamps old at station during season of 1896, $175.30; mail received from main office and boats, June 19 to December 16, 1895, 46,994 pieces; mail received from main office and boats, April 16 to December 16, 1896, 175,850 pieces, an increase in 1896 over 1895 of 128,856 pieces.

ANNUAL MEETING.

Mr. George L. Quayle, manager and secretary, announces that the annual meeting of the stockholders of the Ship Owners' Dry Dock Co. will be held on Tuesday, January 12, 1897, at 2 p. m., in room 520, Perry-Payne building, for the purpose of electing a board of directors for the ensuing year, and for the transaction of such other business as may come before the meeting.

A SEASON RECORD.

General Manager David Carter of the D. & C. Steam Navigation Co. said Tuesday night at a banquet on board the steamer City of Detroit, at Detroit, that the boats composing that line had traveled 150,000 miles during the last season. He also said that his company had not lost a life for which it could have been held responsible for twenty-nine years.

TO LOWER THE CROWNS OF THE THREE TUNNELS AT CHICAGO.

Capt. J. S. Dunham, president of the Chicago River Improvement Association, in a letter to The Record, says: " The tunnels at Washington, La Salle and Van Buren streets must be lowered, no matter what the cost, or Chicago will lose its marine commerce. The channels of the Chicago river must be deepened, so as to conform to the draft of the vessels now being built, or the city's great marine commerce is bound to seek other ports, and with it will go railway and elevator properties, with the result that irreparable injury will be done the city. No port can hope to retain its commerce with the handicap under which Chicago is now laboring. Vessels have been taking grain charters at South Chicago at 7/8 cents per bushel, while Chicago shippers cannot obtain better rates than one cent. It is simply due to the fact that vessels of deep draft can reach the former place which cannot possibly get up the river here."

Capt. Dunham is collecting evidence to forward to the Secretary of War showing the extent to which navigation in the river has been obstructed.

In this connection it may be noted that the city of Chicago owns the Washington and La Salle street tunnels and a street railroad company the Van Buren, but it uses the three tunnels almost exclusively, and as a matter of business it should meet the expense of lowering the tunnels so as to be no longer an obstruction to navigation.

Working along the lines brought out and emphasized by Capt. Dunham, the Chicago Post recently printed the following editorial:

"There can be no doubt that the entire sentiment of business in Chicago is behind the demand of Capt. J. S. Dunham for the immediate lowering of the three tunnels under the Chicago river. Today these tunnels are the terror of deep draft vessels using the Chicago harbor, and scarcely a day passes that some heavily laden lake barge does not scrape or hang upon one of them. The grounding of the City of Rome on the top of the Washington street tunnel Monday, where she stuck for 24 hours, was only a single instance of the delay and danger occasioned by tunnels less than sixteen feet below the water level.

"With the standard of lake draft fixed at 21 feet by the contracts let by the government for the dredging of the channels between Lakes Huron, Michigan and Superior, no argument is needed to emphasize the necessity for the immediate lowering of the tunnels under the Chicago river. At present their tops fix the maximum draft of the shipping using our harbor. This is at least five feet less than the present standard of lake navigation and ten feet less than the minimum of deep-water ocean navigation.

"It is impossible to estimate the extent of the handicap placed upon Chicago's great shipping interests by the roofs of its river tunnels. They form a barrier to the further development of its mercantile supremacy which only their depression can remove. Already the annual loss to Chicago is incalculable, and no one can compute what the continuance of the obstruction will cost.

"Congress has appropriated $750,000 for deepening the Chicago harbor, which is not available for the actual improvement of its navigation so long as the tunnels at La Salle, Washington and Van Buren streets bar egress and ingress to its docks.

"It is a plain duty of the United States to order the depression of these obstructions to navigation. But the city of Chicago should anticipate the action of the government by arranging with the street car companies for the immediate lowering of the tunnels.

"Citizens of Chicago have a secondary interest in the depression of the tunnels as a part of the drainage canal scheme. If it were not necessary in the interests of the shipping supremacy of Chicago it would still be demanded for the sanitary welfare of Chicago. Only the lowering of the tunnels ten feet can assure the 600,000 cubic feet per minute flow ultimately required by the drainage act."

ANNUAL IMMIGRATION.

The number of immigrants arriving in the United States during the fiscal year was 343,267, of whom 340,468 were permitted to land and 2,799 were debarred on various grounds prescribed by law, and returned to the countries whence they came, at the expense of the steamship companies by which they were brought in. The increase in immigration over the preceding year amounted to 84,731. It is reported that, with some exceptions, the immigrants of the past year were of a hardy, laboring class, accustomed and able to earn a support for themselves; and it is estimated that the money brought with them amounted to at least $5,000,000, though it was probably much in excess of that sum, since only those having less than $30 are required to disclose the exact amount, and it is known that many brought considerable sums of money to buy land and build homes.

Including all the immigrants arriving who were over fourteen years of age, 28.63 per cent. were illiterate, as against 20.37 per cent. of those of that age arriving during the preceding fiscal year. The number of immigrants over fourteen years old, the countries from which they came and the number of illiterates among them were as follows: Italy, 57,515, with 54.59 per cent.; Ireland, 37,496, with 7 per cent.; Russia, 35,188, with 41.14 per cent.; Austria-Hungary and provinces, 57,053, with 38.92 per cent.; Germany, 39,544, with 38.96 per cent.; Sweden, 18,821, with 1.16 per cent., while from Portugal there came 2,067, of whom 77.69 per cent. were illiterate. There arrived from Japan during the year only 1,110 immigrants, and it is the opinion of the immigration authorities that the suspension heretofore existing to some extent of a large immigration from Japan to the United States is without any substantial foundation.

HOLLOW FORGED SHAFTS.

The Bethlehem Iron Company of South Bethlehem, Pa., has recently invaded a new field with their hollow forged shafts. They have been introducing them on the Mississippi and Ohio rivers for stern wheel steamers. Last week they closed a contract with the Pittsburg & Cincinnati Packet Line, of Cincinnati, Ohio, for a hollow forged nickel steel oil-tempered shaft, 38 feet 9 inches long, 14 inches outside diameter, with a 7-inch hole running through it. Such a draft is 3,500 pounds lighter, and 3½ times stronger than the shaft which ordinarily would be placed in such a vessel, which would be made solid of wrought iron. This shaft goes into the new vessel which these people are having built at the Cincinnati Marine Railway, Cincinnati, Ohio.

The Bethlehem Iron Company also sold a shaft recently to C. Jutte & Co., through Shook, Anderson & Co., of Pittsburg, Pa.

They are also arranging to put a similar shaft into the new steamer which the Mississippi Valley Packet Company, of New Orleans, La., will shortly have built.

In a paper recently read before the Western Society of Engineers by Mr. H. F. J. Porter, general western sales agent of the Bethlehem Iron Company, he spoke of these hollow forged shafts which he was introducing on the Mississippi and Ohio rivers, and said that, as compared with a wrought iron shaft 14 inches in diameter and 30 feet long, whose strength would be taken as unity, a solid steel shaft would be 1-3 times stronger. A solid nickel steel shaft would be 1½ times stronger. A steel shaft of the same outside diameter with a 3½-inch hole through it and oil-tempered would be twice as strong. A hollow nickel steel shaft of the same type would be three times as strong. A hollow forged steel shaft of the same weight but of 22 inches outside diameter and with a 17-inch hole through it would be three times as strong, and if oil-tempered, 4½ times as strong. If made of nickel steel it would be six times, and if oil-tempered, eight times as strong.

It is no wonder that boat owners on the rivers are glad to take advantage of this improved type of shaft in view of the great mortality in the past of solid wrought iron shafts, which break after short service, and when they break the accompanying loss is usually very large.

BUFFALO'S COAL TRADE AND FREIGHTS.

The following statistics of the coal trade of Buffalo, N. Y., were prepared by Mr. William Thurstone, Secretary of the Merchants' Exchange, showing the season's business to December 1st, 1896, and for a series of years:

Railroad receipts and shipments of coal at Buffalo not reported by request. Receipts of coal by lake for this and for several years past, none. Shipments of coal westward by lake for the month of November, 367,610 net tons, as compared with 533,708 net tons in 1895, and 433,050 net tons in 1894; for the season to December 1st, 2,320,668 net tons, as compared with 2,496,033 net tons in 1895, and 2,386,405 net tons in 1894. The aggregate shipments of coal this season show a decrease of 175,365 net tons under 1895, and 15,737 net tons under 1894.

The rates of freight for November this year were 30c., 40c., 60c. to Chicago and Milwaukee; 20c., 30c, 50c. to Duluth and Lake Superior ports, Gladstone; 20c., 50c. to Ashland; 40c. to Saginaw, Racine and Green Bay, and 25c., 30c. to Toledo. A year since the rates were 75c., 90c. to Chicago; 80c. 85c, to Milwaukee; 85c., 90c. to Sheboygan; 85c. to Green Bay; 65c., 70c. to Saginaw; $1.00 to Racine; 50c. to Toledo; 50c., 60c. to Bay City, and 30c. to Ashland and Washburn.

The distribution of coal this season was about as follows: 934,157 net tons to Chicago, 625,706 tons to Milwaukee, 231,960 tons to Duluth, 88,090 tons to Toledo, 36,334 tons to Manitowoc, 29,800 tons to Gladstone, 10,950 tons to Ashland. 189,331 tons to Superior, 13,075 tons to Marquette, 12,489 tons to Fort William, 4,420 tons to Sault Ste. Marie, 1,070 tons to Portage, 11,860 tons to Lake Linden, 225 tons to Goderich, 74,300 tons to miscellaneous ports by vessels from Tonawanda, 1,750 tons to Marinette, 5,200 tons to Hancock, 400 tons to Ontonagon, 3,150 tons to Detroit, 1,200 tons to Benton Harbor, 388 tons to Midland, 800 tons to Cheboygan, 530 tons to Sturgeon Bay, 475 tons to St. Clair, 678 tons to Windsor, 100 tons to Alpena, 300 tons to Manistique, 500 tons to Huron, O., 23,875 tons to Racine, 400 tons to Marine City, 450 tons to Algonac, 3,350 tons to Washburn, 26,200 tons to Green Bay, 8,890 tons to Kenosha, 200 tons to Oscoda, 14,665 tons to Bay City, 13,345 tons to Saginaw, 525 tons to St. Ignace, 2,050 tons to Menominee, 1,250 tons to Cheboygan, 300 tons to Bay Mills, 1,150 tons to Port Huron, 600 tons to Grand Haven, 2,100 tons to Port Arthur, 320 tons to Sand Beach, 2,125 tons to Michigan City, and 25 tons to Grand Marais.

A few additions will be made to the Chicago, Superior and Milwaukee shipment figures for December, and then the preceding statement will show the year's movement.

WINTER NAVIGATION.

It seems that the Toledo & Ann Arbor Railway people had other lines out while they were dickering for the charter of the Green Bay Hart Line steamers, for no sooner had negotiations in that direction fallen through than they closed a deal with the owners of the A. L. Hopkins and J. C. Ford, which secures the services of these steamers for the winter route between Frankfort and Kewaunee. The Ford is classed A1* with a net tonnage measurement of 598 tons, while the Hopkins classes A2 and measures 640 net tons.

Supt. Blizard, of the Michigan division of the Big Four, states that the negotiations for the Big Four's winter line of lake steamers to ply between Benton Harbor and Chicago and Milwaukee, connecting with the Michigan division of the first named point, were about concluded, and that the independent line would be put on next week unless satisfactory traffic relations with the Graham & Morton Transportation Co. are previously made. This lake line has two of its steamers equipped for navigation through the ice, and delivers about thirty cars of through freight to the Big Four daily.

NOTICE OF REMOVAL.

The firm of L. W. Ferdinand & Co., after being established for 23 years at 267 Federal and 25 to 29 East streets, Boston, will remove about January 1 to 176-180 Federal street. The new quarters will have over 4,000 feet of space in the salesroom on the first floor or nearly double what they have now. The boat warerooms will be 218-220 Purchase street, this location being handy to the large hardware and ship chandlery department of the firm. Messrs. Ferdinands state that as the new location is more central they feel that, although removing is an unpleasant job to look forward to, it will in the end be for the best interests and benefit of the firm.

NOTICE TO MARINERS.

Editor "Marine Record:"

The hydrographic office has received the following notice to mariners from Commander J. H. Dayton, U. S. Navy, Light-House Inspector, 9th District, Chicago, Illinois, dated December 15th, 1896:

"Notice is hereby given that the Simmons Reef, White, Shoal and Grays Reef Light vessels, Nos. 55, 56 and 57, left their stations December 12th, 1896, and have gone into winter quarters.

"Also, that Sturgeon Bay Canal Beacon No. 3, at entrance to cut leading from Sturgeon Bay to Canal, has been carried away by the ice, and will be replaced at the opening of navigation in the Spring."

Cleveland, Dec. 16th.

LEBANON CHAIN WORKS, LEBANON, PA.

This flourishing company was organized in 1891, at Lebanon, Pa., and has been in successful, continuous operation since that time.

The officers are men of more than ordinary business qualifications, and are well known throughout the East in iron circles. They are as follows: Thos. Evans, president, who is a recognized leader in the rolling mill business, having devoted 45 years of unremitting toil to the cause; Herbert Hecht, with 15 years' experience in mill work, and generally regarded by iron men as one of the "coming men" in this particular branch, is secretary; H. T. Atkins, treasurer, is well known throughout the Keystone State, and enjoys the confidence of a host of friends; Eli Attwood is superintendent; to his well-directed efforts, with 30 years' experience, can be ascribed much of the success of the concern.

These men, by their combined fitness, have placed upon the market a high class of work unparalled in the history of chain manufacturing. This is a statement that is even admitted by their competitors.

During the past four years they have been supplying the U. S. government with "light-vessel" chain, and to those familiar with the exacting requirements of "Uncle Sam," the fact will at once commend itself of the recognized superiority of the goods.

On their 2-inch light-vessel chain they have taken the world's record. The breaking test on the above size, made last May, by U. S. Inspector Morgan, was 274,000 and 271,000 pounds, respectively, whereas the government only requires 250,000 pounds. These and other similar results have given the government such unlimited confidence in their work that in giving out specifications for the building of their dredges they specify the Lebanon Chain Works chain.

The management has one of Riehle Bros. testing machines, herewith illustrated*, and it is one of the best that this noted firm is capable of turning out. It has a capacity of 300,000 pounds, and is the second machine ever licensed by the Lloyd's Association, of London, Eng., for testing chains in this country.

*Or it would have been had not the cut melted to molten metal when running this article off on the press.

FIRST OF THE SEASON'S CALENDARS.

David Kahnweiler, 437 Pearl St., New York, sends us the first 1897 calendar of the season. It is well known that Kahnweiler furnishes metallic life rafts, boats and cork goods of every description, also that his life-saving appliances have been approved by the board of supervising inspectors of steamboats. Taking the above as his cue Mr. Kahnweiler has issued an elegant engraved card 14x11 inches, in clear, large type, with the upper half showing a lifeboat rescuing passengers from the leebow of an apparently stranded vessel and bearing the title, "Women and Children First." We can't just call to mind the original of this plate, but we recognize how appropriate such a subject is for the business of Mr. Kahnweiler, and in congratulating him on selecting so fitting a subject, we take the opportunity of thanking him for the courtesy of mailing us several copies of same. As The Record offices require but two of these handsome calendars the remainder are at the disposal of our friends and patrons in the vessel business.

CONDEMNS THE COMPASS.

A lake captain speaks his mind in regard to the deviation of the compass and says it is about worthless as a guide. He tells a Detroit paper that he cannot rely on it at all. "When I get up in the Pictured Rocks region," he says, "I find that I can rely on my binnacle only with the aid of approximation of distances and guesswork. Many a time have I set my course for Duluth harbor as nearly as I could with the compass and chart, and holding her true to it have found that the compass has carried me several miles to one side of the destination. After a few of these trials I have found that my own calculation, assisted by the means I have mentioned, has done better for me than all the compasses that were ever invented.

"The ore carriers and the carriers of pig iron or manufactured iron always find their compasses affected to a more or less extent by the 'local attraction.' The compass adjusters claim they can so fix the compasses as to guard against this, but I claim that they cannot with the present knowledge and means at their command, and I have to support my view the fact that they never have done it. Do you remember when the big iron steamer H. J. Jewett, fifteen years ago, the crack steamer in the Union steamboat line, and also the fastest and most modern steamer on the lakes, went on the rocks off White Rock, Lake Huron, and was compelled to jettison all of her cargo before she could be released? It was a fine cargo, too, of dry goods, the best of groceries and barreled sugar, all bound for Chicago wholesalers. The total loss was something like $75,000.

"The late Capt. A. W. Reid was her master then, and he was one of the best men that ever sailed a lake craft. It had to be a man with a good record to be given command of the then best boat on the lakes. Well, he went ashore in a dense fog, and it came out afterward that his compass had been so affected by a lot of iron he carried that in the short run up from Port Huron he found himself ashore, when he supposed he was two miles further out into the lake. He was degraded to the command of the B. W. Blanchard, the smallest and oldest boat in the line, and he would have been discharged entirely, perhaps, had it not been for the good work he had rendered on other boats in the line. He had too much self-respect to stay in that boat, and when Morley of Marine City offered him the command of the Italia, he accepted, and from that time to his death he sailed the best tramp steamers, and without an accident.

"That was what a false compass did for one man, and I could name a dozen such instances were it necessary. I hope the time will come when some inventive genius will come forward with an idea that will forever guard against local attraction or any other kind of attraction."

This fellow wants to sail by guess and as we all do, by God. It is hard to believe that such ignorance is still rampant on the lakes.—Ed.

OLD TIME IRON STEAMERS.

Many of our readers, especially in shipbuilding and engineering establishments on the lakes, will remember of the recent visit of Messrs. Cornish & Thearle, representing Lloyd's Register of British and Foreign Shipping, London. Mr. Thearle, as is generally known, is in charge of that association's interest at Glasgow, Scotland, and in a recent letter to The Record expresses in part as follows:

"I see from a copy of The Record, just to hand, that my friend, Mr. J. R. Oldham, has been addressing your Civil Engineers' Society at Cleveland, and giving them some interesting statistics. He mentions the Michigan U. S. revenue cutter, built in Erie fifty-two years ago, and now afloat on Lake Erie, and says she is the oldest steamer in active service. I don't know in what month of the year 1844 the Michigan was launched, but the iron paddle steamer Glengarry, which was launched at Glasgow in 1844 under the name of Edinburgh Castle, is a close competitor for the honor claimed on behalf of the Michigan. The Glengarry is owned by the well-known David McBrayne, and is actively employed in the West Highland service under a passenger certificate from the board of trade. I may also remark that the iron paddle steamer Glencoe, owned by Mr. David McBrayne, and still employed on the route between West Loch Tarbert and Port Allen in Islay, was built at Glasgow in 1846.

Mr. Oldham is further reported to have said that Sunderland is the greatest shipbuilding port in the world. Now in this he is mistaken. Taking, for instance, the year ending 31st December, 1895, the tonnage built on the four principal shipbuilding rivers of the United Kingdom are as follows: Clyde, 360,152 tons; Tyne, 166,053; Wear, 137,703; Tees, 101,862.

Even on the supposition that Mr. Oldham does not credit all the Clyde work to the port of Glasgow. we shall find the Clyde tonnage apportioned thus: port of Glasgow, 253,959 tons; port of Greenock and smaller ports on the Clyde, 106,193, which still leaves the port of Glasgow with nearly double the tonnage built at the port of Sunderland last year.

"The work turned out on our several rivers varies, of course, from year to year, but when there is a shipbuilding "boom" on, all the rivers get their share of it, and the relative tonnages do not vary much."

American Shipbuilder, New York, rises to remark as follows: "Will the plans of the Consolidated Canal and Lake Co. materialize? The long talked of Montauk Point and Milford Haven steamship route didn't." It must not be forgotten, however, that a lake ship-builder has been asked for figures on a fleet of 30 wooden canal boats.

A WHALE STORY.

The New York Sun has lately been printing a series of letters from various people on the subject of "Jonah and the Whale." How this became a topic for discussion in the Sun does not appear. Some of the writers discuss the question seriously, affirmatively and negatively—the former taking the ground that to doubt the story is to impeach the Bible, to deny that miracles have been worked, that it is not stated that a whale swallowed Jonah, but a large animal which might have been a shark, or some other sea monster, and that the miraculous element does come into the transaction at all. Most of these letters, we understand, are weary reading.

Among a lot of these argumentative documents, one appeared this week not argumentative, but quite startling. The writer favors the shark idea as against that of the whale, and he does this because of an incident which he relates and which is, briefly as follows.

Some years since a ship on the Mediterranean had among her passengers a father and son. The father died at sea; the body was enclosed in canvas as usual though with a grind-stone and an ax for sinkers. As the body was lowered into the sea, the son, in an ecstacy of grief, jumped overboard and all efforts to rescue him were fruitless. The next day a huge man-eating shark, which had been following the ship, was captured and hauled on board. Notwithstanding that the monster was dead as a hammer a strange noise seemingly coming from "his little inside", was heard. The fish was cut open and the father and son were found, the father sharpening the ax while the son turned the grindstone preparatory to cutting their way out. The old gentleman had been cast overboard in a trance, and the shark had swallowed him and his son.

This seems a rather tough story, and if it had appeared in any other paper we should doubt it, but then, you know, "If you see it in the Sun, it's so." At the same time we also know it be an old sailor's yarn and a very ancient one at that.

LIQUID FUEL.

In his annual report to the Secretary of War the chief of the bureau of steam engineering, U. S. N., states that the experiments conducted at the New York Navy Yard in using liquid fuel in the third-class torpedo boat of the Maine have been completed. The evaporative results were good, even at the highest rate of combustion, and it only remains to ascertain whether the stowage and carrying of this fuel can be so effected as to eliminate danger from the gas that may be given off, which is one objection to the use of any fuel oil other than petroleum refuse. It is to be regretted that conditions, other than those pertaining to the system of burning the fuel in these boats, operated to prevent a trial of the boat in free route for any length of time.

The department having authorized the fitting of this system in one of our tugs, in order to demonstrate its practicability under ordinary conditions of service, preparations are being made to use "fuel oil" only in this boat, and it is hoped that the results will be such as to warrant its general use for tugs and torpedo boats.

ORE MINING OUTPUT.

The 1896 output of the iron mines will not be accurately known until after January 1. However, the following figures, compiled by the Duluth papers, will be found nearly correct:

Lake Superior, 448,000; Champion, 115,000; Chapin, 421,000; Pewabic, 185,000; Norrie and Babst, 375,000; Aurora, 185,000; Tilden, 242,000; Newport, 131,000; Mahoning, 157,000; Oliver, 808,000; Adams, 235,000; Penn. I. M. Co., 180,000; Cleveland-Cliffs Iron Company, 520,000; Lake Angeline, 339,000; Minnesota, 448,000; Chandler, 472,000; Queen I. M. Co., 325,000; Mountain Iron, 143,000; Montreal, 130,000; Pioneer, 148,000; Republic, 127,000; Franklin, 231,000; Sellers, 153,000; Biwabik, 243,000; Fayal, 249,000; Auburn, 131,000.

NEWLY REGISTERED.

From the statement of official numbers assigned to merchant vessels by the bureau of navigation, treasury department, Washington, D. C., during the week ending Dec. 5, we find eleven vessels newly registered. The steamer Pere Marquette, built by F. W. Wheeler & Co., W. Bay City, Mich., has a gross tonnage of 5,580, and this is more by nearly one hundred tons than the aggregate tonnage of all the other vessels registered for the week. The lakes are still ahead in building, commerce and transportation.

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PUBLISHER'S NOTICE.

To our patrons and subscribers, we desire to ask leniency for the delay of forth-eight hours which they have experienced, in receiving our usual issue. The facts of the case are that when on the press, the large new four-story brick building of our printers, Messrs. Whitworth Bros., caught on fire from some unexplainable cause, and the entire outfit of The Marine Record perished in the flames. Such is the week's story. However, The Marine Record may have, and in fact has, been on a lee shore many a time, yet with the finest kind of scientific navigation, she has pulled to windward.

The present instance is perhaps the hardest blow that we have ever experienced, but Phoenix-like, rise from the ashes into our full blown costume again. Let our readers and patrons understand that it is a serious matter which will lay a daily newspaper low for forty-eight hours, and this with the work of their several editors and staff of correspondents, when this blow comes upon a class or technical paper that goes to press once a week, and with a limited staff, the blow is proportionately heavier. We may further say, that every vestige of type, cuts, illustrations, proof and copy went up in the flames. This issue has been entirely created within forty-eight hours, and we feel proud to say that it is nearly up to our usual standard, though not as fulsome as the special copy which we had prepared for our readers this week and shorn of its editorials.

In conclusion, presuming that our best friends will accept the foregoing apology for our delay in the date of publication, we wish to express our thanks to the several publishing houses of Cleveland, for their voluntary and courteous offers to assist us in this crisis.

However, The Marine Record like the class to which it caters, can never be cast away on a lee shore. Canvas blown away, spars gone, pumps choked, and leaking sufficiently to abandon all hope, we have met the occasion, and jury rigged though slightly behind our schedule time, we come to windward all taut and in shipshape order for the future and so as to be strictly on time for our next issue.

While not of general, we may assume to say that it will be of local importance to announce that the publishing house of J. B. Savage proffered their timely assistance to The Marine Record, and in accepting the kindly offer of that firm, we can but acknowledge the assistance we have received from their entire staff.

We now ask the leniency of all our friends in this special issue, which as we have said has been entirely collaborated since the burning of our lock, stock and barrel.

TURNED DOWN.

Ever since lake shipbuilders began looking for government contracts there has been a feeling that the heads of departments at Washington were not favorable to lake competition. The chief excuse for not awarding warship contracts to lake builders is the existence of a treaty with England which lake men do not believe applies to the construction of ships to be taken to tidewater, but the officers at Washington have decided that the treaty does apply in such cases, and therefore the lake builders are shut out. A case has just come to light, however, which indicates a desire to turn down the lake builders in cases where treaties with foreign nations do not stand in the way. A short time ago bids were asked for the construction of a small steamer for the use of United States engineers at Baltimore. The Detroit Boat Works sent in a bid which was $2,100 lower than the next lowest, that of an eastern firm, but the contract was not secured. In answer to an inquiry as to the reason for the rejection of the bid the Detroit people were informed that the boiler which they proposed using did not meet the ideas of the goverment officers. The difference, however, between the Detroit bid and that of the successful firm was sufficient to pay for the building of several boilers of any design required. The Detroit people believe that they are being discriminated against, and have called the attention of Senator McMillan to the matter.

FORTY-FOOT CHANNEL A FAILURE.

Capt. Alex. McDougall, the Duluth ship-builder, says the 20-foot channel project from Duluth to Buffalo will never be realized. He not only scouts the idea of a 20-foot draft, but of improving on the present.

"In consequence of the higher level of Lake Superior," the captain says, "there must be a correspondingly greater volume of water passing over St. Mary's falls and through the river into Lake Huron, yet we are confronted with the fact that the draft in the river is not increased at the points where improvements have been made. Further menace is the Chicago drainage canal. Everything is against the 20-foot project, and I look to see a lesser draft before I see it deeper than now."

ABANDONED THE CRUISE.

Capt. Adolph Frietsch has given up the voyage around the world which he was to undertake in the small sailboat named the Schlitz Globe. Instead, he will start by rail for San Francisco about Dec. 28, with the intention of building a new vessel for a voyage to Honolulu.

With the Schlitz Globe, which he built in Milwaukee last summer and which afterwards was rebuilt at Racine, he went as far as La Salle, Ill., where the boat is now wintering. Capt. Frietsch had towed the vessel through the canal and reached Peru about the time cold weather set in. He asked the company to defray the expenses of towing the boat to Peoria, whence the Mississippi river could be easily reached. The price of towing the Schlitz Globe that distance was fixed at $25, which the Schlitz Brewing Company refused to pay, on the ground that, according to contract, it was not liable for such expenses. At La Salle the vessel is icebound and it will have to remain there all winter, during which time the Schlitz Brewing Company, had the contract remained in force, would have had to pay $50 a month to the family of Capt. Frietsch.

Capt. Frietsch said that he would refuse to resume the trip. So far he had not been able to make expenses. The people in the towns which he had passed took no interest in his plans. He sold copies of a narrative of his voyage in the Nina, furnished by the Schlitz Brewing Company, at the rate of 10 cents a copy, but did not sell enough to satisfy him.

CHICAGO OR SOUTH CHICAGO.

It has been evident for some years that the Chicago rievr, with its swing bridges at every few hundred feet, and tunnels built so as to allow a scant sixteen feet draught over their crowns, that large tonnage would soon be compelled to seek some other port adjacent to Chicago. In the annual report of Capt. Marshall, Corps of Engineers, U. S. A., to the chief of engineers at Washington, this question is dealt with in the following pertinent terms:

At the Calumet, it appears evident, must be met the demand at Chicago for a deep harbor. The Chicago river is so obstructed by bridges, tunnels, narrowing of channels, bends, and from the demands of inter-urban communication across and over its branches (and will be much further obstructed by a current, also for drainage purposes) that it appears nearly a hopeless task to create or maintain a practicable 20-foot deep channel in that stream that may accommodate the vessels over 400 feet in length, 45 to 50 feet beam, and 19 feet or more draft, that are now building, and that will navigate the new channels 20 to 21 feet deep between the Great Lakes that will be completed within two years. Commerce and navigation will follow the least obstructed channels, will prosper and flourish along the lines of least resistance measured by money, and the business in transit at this great port will be transacted at that one of its harbors where it is more free and less obstructed.

The drift of commerce plainly shows the tendency to decadence at the Chicago river, and the phenomenal increase in commercial importance of Chicago's southern harbor at the Calumet. It is my opinion that this process has but just begun, and that the demand for a 20-foot capacious harbor at this, the greatest port on the lakes, is absolute and urgent, just at hand, and that the policy of small appropriations, under which the construction of Chicago harbor extended over the period from 1833 to 1890, will not meet the necessities of a case where a present commerce of over 11,000,000 tons per annum is seeking accommodations demanded by conditions that will operate in full force within three years.

The port of Chicago, the largest and most important, commercially and numerically speaking, on the Great Lakes, and among the four greatest ports on the earth, must descend to the grade of a third-class port in facilities for navigation, or be maintained in its present position and importance by prompt and adequate appropriations and work. It is not a matter of sixty years to develop a port, but it is now a matter of two or three years to maintain an existing commerce.

There are evidently required at Chicago accommodations for an interstate commerce carried in vessels over 400 feet in length and of over 19 feet draft, to be provided within, say three years. Such vessels can only peer into this port from the open lake. They cannot enter it at either harbor.

In Chicago river, by an enormous expenditure, these vessels can be accommodated by imposing or continuing a grievous hindrance to urban intercommunication. At the Calumet, at a comparatively small expenditure, they may be accommodated without annoyance to the population of the city seeking its business center.

IN WINTER QUARTERS AT DETROIT.

The following vessels are in winter quarters at Detroit: Steamers Hurlbut, Mascotte, Companion, Stimson, Colonial, Aragon, Continental, City of Mt. Clemens, John Oades, A. A. Parker, John Owen, Idler, Vita, Pastime, City of Toledo, Nipigon, St. Paul, City of Buffalo, Toledo, Greyhound, Ogemaw, City of Alpena, City of Mackinac, Darius Cole, Senator, C. H. Starke, Hancock, Marigold, Warrington, Amaranth, B. W. Blanchard, Selwyn Eddy, Folsom, Seattle, Flora, Atlantic, Forest City, Wyandotte, Hackett, Frank E. Kirby, Fessenden, Newsboy, Snook, H. S. Pickands, Mary, Houghton, City of the Straits, Ionia, Haze, City of Detroit, City of Cleveland, State of Michigan, Whitaker, Pahlow. Schooners: Reuben Doud, D. K. Clint, Julia Larsen, Southwest, J. S. Richards, Mystic Star, Mongaugon, Redwing, San Diego, B. W. Parker, Melbourne, M. J. Wilcox, Canton, Senator, Loveland, A. B. Norris, M. B. Mitchell, Nelson, S. U. R. Watson, Wm. McGregor, H. H. Brown, Barkalow, Wm. Stone, Dacotah, Fostoria, Bay City, O. J. Hale, Lily May, Marengo, George Wand, Delta, Black Diamond, Koal Kabin, Sonora. Tugs: Quickstep, Grace Ruelle, C. A. Lorman, Saginaw, Wales, Kate Williams, Duaping, Balize, Champion, Swain.

The steamers Iron Chief, Iron Age, Iron Duke, S. J. Macy and Stafford, and the schooners Iron State, Iron City, Iron Cliff, McWilliams, Francombe and Mabel Wilson, are laid up at Wyandotte, and the schooners Abbie L. Andrews, John Magee, J. F. Mott, Mineral State, St Clair, Lone Star and Presto are laid up at Sandwich.

According to the report of the harbormaster of the port of Tacoma, Wash., as furnished to the Marine Record, we find that for the eleven months of 1896 to December 1, the total exportation of grain was as follows: Wheat, 2,545,589 bushels, valued at $1,673,367; flour, 303,438 barrels, valued at $904,559.77. The inward registered tonnage was 533,532, inward cargoes 70,294 tons; outward registered tonnage 565,649, outward cargoes 585,607 tons. Deep sea arrivals 393, departures 374.

LAKE SHIPPING.

The report of the Commissioner of Navigation shows that there were 698 steam vessels of 1,000 tons and over used in the United States on June 30. The report brings the tonnage on the great lakes prominently to the front. There were 383 vessels of the class referred to on the northern lakes, the gross tonnage being 711,034.28. The Atlantic and Gulf Coast claimed 257 vessels, of 537,841.86 gross tons, and the Pacific Coast 45 vessels, the gross tonnage being 92,466.74.

Cleveland does not lead in the number of vessels, but the district, which includes Conneaut, Ashtabula, Fairport and Lorain, is foremost in the amount of gross tonnage by about 70,000 tons. The number and gross tonnage of vessels owned on the lakes on June 30, 1896, is shown by the following table:

Customs Districts.	Number.	Gross Tonnage.
Cuyahoga	267	271,609.59
Buffalo Creek	388	191,833,81
Huron	449	204,002.78
Detroit	289	167,197.15
Milwaukee	350	91.627.23
Chicago	264	71,793.40
Champlain	358	36,357.99
Superior	164	72,577.40
Sandusky	96	46,375.00
Michigan	279	33,935.97
Erie	63	38,671.72
Oswegatchie	51	23,576.74
Oswego	45	8,578.25
Miami	80	27,905.99
Niagara	7	2,369.33
Vermont	29	4,767.58
Genesee	16	1,127.78
Cape Vincent	56	3,623.65
Duluth	80	26,078.73
Dunkirk	2	57.49
Total	3,333	1,324,067.58

The growth of late lake shipbuilding is displayed in the following figures:

Vessels of all kinds built on the lakes during five years past:

	Number.	Gross Tonnage.
WKtaoi C—1: d taoin taoin taoin taointaoin taoinW		
Year ending June 30, 1892	169	45,968.98
Year ending June 30, 1893	175	99,271.24
Year ending June 30, 1894	106	41,984.61
Year ending June 30, 1895	93	36,352.70
Year ending June 30, 1896	117	108,782.38
Total	660	332,359.91

In these statistics no account is taken of yachts, lighters, or small boats employed within the harbor of any town or city, nor of canal boats or barges employed wholly upon internal waters of a State. All vessels under five tons net are also excluded. The boats in the Champlain district are principally canal barges.

HYDROGRAPHIC OFFICE REPORTS.

LAKE MICHIGAN.

Reported shoal midway between Squaw Island reef and Lansing shoal.—The steamer Wm. A. Haskell on October 7, 1896, struck a supposed shoal in Lake Michigan midway between Squaw Island reef black spar buoy and Lansing shoal red nun buoy; there was a heavy sea running at the time. A cast of the lead gave three fathoms least depth. This spot is about two-fifths of a mile north of the usual course of steamers; the charts show there a depth of fourteen fathoms. Other steamers have reported striking in the same vicinity; therefore, mariners are cautioned to take soundings in that locality.

ST. MARY'S RIVER.

Hay Lake channel.—Hay Lake.—Michigan.—Waldo shoal buoy.—On October 16, 1896, the steamer L. C. Waldo, while proceeding down Hay lake, St. Mary's river, struck heavily near a spot, commonly called the red stake, above Nine Mile point. The Waldo was drawing 16 feet; a northwest gale was blowing at the time, which, no doubt, lowered the water about a foot. The spot has been marked by Waldo shoal buoy, a red, 25-foot spar. Nine Mile point light bore S SE. 5/8 E. (S. 29° 30′ E.), from the buoy, distant 3,800 feet. Least depth of water over the shoal is 16½ feet. The shoal is about 150 feet long and 50 feet wide.

LAKE HURON.

Georgian bay.—North channel.—Canada.—Rocks located.—The following rocks in North channel, Georgian bay, have been accurately located; the datum for depths given is the mean summer level of Georgian bay, but the water is now about three feet lower than that mean level.

Rock in western approach to Algoma Mills.—A small rock with eight feet of water over it lies S. 7/8 W. (S. 10° W.) from Simon rock, distant 1,650 feet; the rock is shown on the charts as the northern of the two southwest patches, and as having 18 feet of water over it. (This rock was referred to in Notice to Mariners for the Great Lakes, No. 8 (132) of 1895).

Rocks in Whalesback channel.—A small rock with nine feet of water over it lies SW. by W. 5/8 W. (S. 63° 30′ W.) from the west end of Parsons island, distant 750 feet; another rock, awash, lies W. 5/8 S. (S. 83° 15′ W.) from the west end of the western Mulock island, distant 825 feet; still another rock, awash, lies E. 3/8 N. (N. 86° E.) from the dry rocks off the southeast end of Edgar island, distant 150 feet.

Rock in Aird bay.—A small rock with eight feet of water over it lies W NW. 1/8 W. (N. 68° 45′ W.) from the north end of Lister island, distant 450 feet.

Rock in French river harbor entrance.—A small rock with 11 feet of water over it lies E. ½ N. (N. 84° 15′ E.) from Lefroy Island lighthouse, distant 120 feet; this rock is almost in mid-channel and vessels may pass on either side of it.

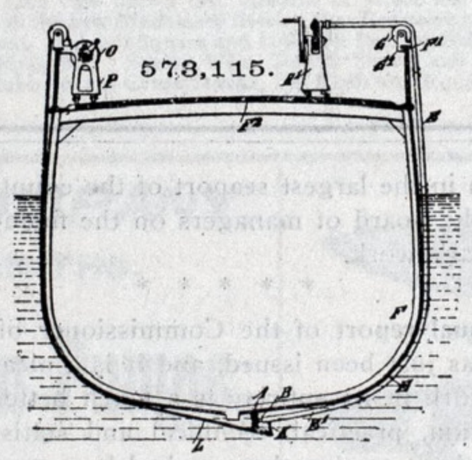
LAKE ERIE.

Reported obstruction on direct course between Detroit river lighthouse and Point Pelée lighthouse.—In the early morning of November 1, 1896, the steamer Saxon struck some hard and apparently sharp obstruction on her port side, and along which she raked to somewhere near amidships and then cleared. The Saxon was 1¾ (2) miles ESE. ½ E. (S. 73° E.) from Detroit river (Bar Point) lighthouse; the charts show four fathoms of water at this point. The Saxon's draft was 16 feet. The steamer Cambria struck an obstruction in that vicinity on August 23, 1895. The Saxon encountered this same obstruction, presumably.

Pelée passage.—Steamer struck on Grubb reef.—Caution.—The steamer E. B. Hale recently struck a shoal spot of Grubb reef, Lake Erie, about 2 3/8 (2 11-16) miles from Pelée Spit (The Dummy) lighthouse; the lighthouse bore E SE. 3/8 E. (S. 71° 45′ E.) This shoal spot is graphically indicated on H. O. chart No. 1543, and has 17 feet of water over it at normal lake level. Captains of vessels apparently stand too long for The Dummy light when bound eastward; they are cautioned to haul to the southward after passing Pointe Pelée island light.

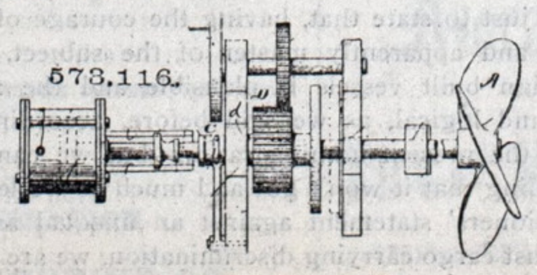
RECENTLY ISSUED MARINE PATENTS.

No. 573,115—Scouring-Brush for Cleaning Ships' Bottoms. Charles P. Turner, New York, N. Y. Filed Dec. 6, 1895.



Claim.—The combination with a vessel, of a bearing slidably mounted on one gunwale of the vessel, a pulley on the bearing, a flexible shaft passing over the pulley, a power-transmitting device carried by the deck of the vessel and connected to the flexible shaft, a brush driven by the flexible shaft, a flexible connection attached to the brush, a winding device having a part slidably connected with the other gunwale of the vessel, and a pulley carried by the winding device over the flexible connection passes to said device.

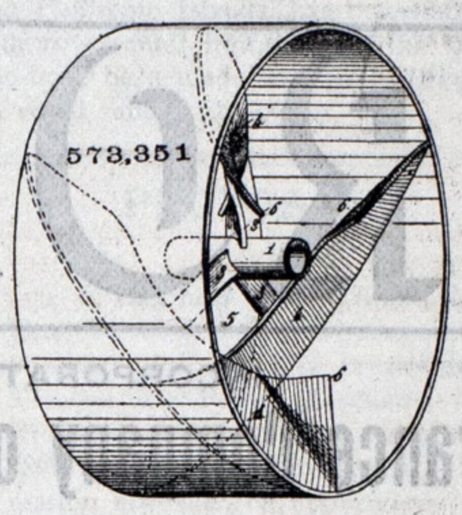
No. 573,116—Governor for Propellers. George D. Turner, Cleveland, Ohio, and George W. Cummings, Monroe Centre, Mich.; said Turner assignor to said Cummings. Filed April 9, 1896.



Claim.—In a governor for a propeller, the combination with a rotatably and longitudinally moving propeller-shaft, provided with a friction-disk rigidly attached to said shaft, of a piston-rod axially in line with said propeller-shaft and a cylinder for operating the same.

In a steam-governor for a propeller, a propeller-shaft rotatably and longitudinally movable in suitable bearings, a friction-disk rigidly attached to said shaft adapted to engage a friction-shoe fixed to a standard suitably disposed; a spring yielding rod to prevent too sudden contact between said friction-disk and friction-shoe, a gear-wheel also attached to said propeller-shaft and having its face of sufficient width to always mesh with a power-driven pinion-wheel and a collar on said shaft arranged substantially as and for the purpose shown and described.

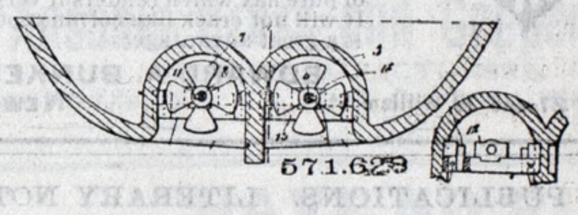
No. 573,351—Propeller-Wheel. Elisha J. Parker, Dallas, Tex. Filed Sept. 17, 1896.



Claim.—1. A propeller-wheel for vessels and boats, consisting of a central hub, a broad rim, a series of spokes connecting said hub and rim, and a series of segmental blades or buckets secured to the outer portions of the several spokes and to the inner surface of the rim in oblique positions and having the inner corner of each blade twisted toward the hub-axis, substantially as described.

2. A propeller-wheel for vessels and boats, consisting of a central hub, a broad inclosing rim, a series of spokes connected with said hub and rim at an angle to the axis of each, and a series of blades or buckets secured to the inner surface of the rim and to the outer portions of the spokes to afford central spaces for passage of surplus water, each blade having the inner corners of its opposite ends twisted toward the hub-axis and in reverse directions at the blade ends, substantially as described.

No. 571,628—Propeller. William M. Tucker, Nelsonpoint, Cal. Filed Aug. 3, 1896.



Claim.—A vessel having a chamber arranged along its keel a propeller-shaft, extended longitudinally through said chamber, a number of propeller-wheels on said shaft, and supporting-bars for said shaft having their ends removably engaged in recesses in the side walls of said chamber.

A vessel, comprising a hull having parallel longitudinal chambers formed along its keel, L-shaped recesses formed in the opposite walls of each chamber, transverse bars adapted to engage their ends in said recesses, the said bars having transverse mortises, a key having a shank portion to engage through a mortise and having a head portion to engage in a recess, a wedge-shaped key for securing the first-named key in position, propeller-shafts supported on said transverse bars, and propeller-wheels removably secured on said shafts.

A PROPER DECISION.

The report of the chief of the engineer corps U. S. A. on certain river and harbor improvements, which has been transmitted by the secretary of war to the house, says:

"So far as the examination of Raisin river, Monroe county, Michigan, from the mouth of the government canal to the wharves, is concerned, it is believed that the cost would vastly exceed the benefits to the commerce of the country. Whatever benefits might accrue would be local, and it is doubted if these would be very great."

A recommendation is made for the improvement by dredging of the harbor at Menominee, Mich., and Wisconsin, at a cost of $19,000. About $7,000 of this amount would be expended outside the present pier heads.

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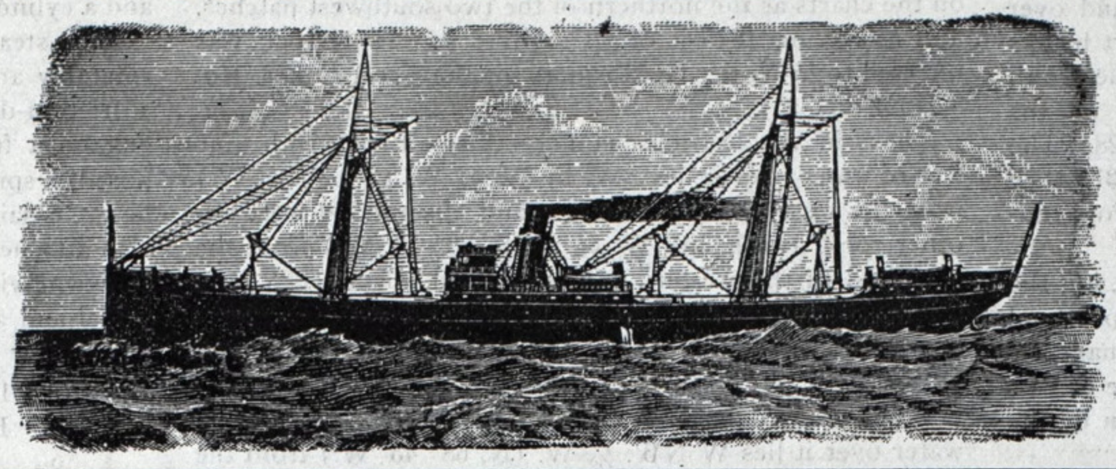

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NEW PUBLICATIONS. LITERARY NOTICES.

The annual report of the chief of the Bureau of Steam Engineering, U. S. N., to the Secretary of the Navy under date of Oct. 1, 1896, has been received this week, and while not in any way voluminous the annual deals with all of the important work being carried on in the department. The work of the several navy yards, tests of two types of water-tube boilers, a general synopsis of the condition of each ship's machinery and a chapter on the personnel of the naval engineer corps are each ably and concisely dealt with in the report.

* * * * *

Scribner's for 1897 will be strong in American enterprises. Both the serials are by American writers, Richard Harding Davis and W. D. Howells. The series on "The Conduct of Great Businesses" will describe American achievements of the first importance. C. D. Gibson, the artist whose reputation was made by his American girl in Life, will adapt his pen and pencil to a description of London. Undergraduate life at American colleges will be described in another series, and the conditions and problems confronting American women will be discussed by Mrs. Helen Watterson Moody, under the title, "The Unquiet Sex."

* * * * *

We have received from Rev. A. R. Mansfield, chaplain of the new Sailor's Home, 52 Market street, New York, a copy of the fifty-second annual report of the work of the Protestant Episcopal Church Missionary Society for seamen in the city and port of New York. In looking carefully over the report we are much pleased to learn of the excellent work carried on at the several branches of this association in the largest seaport of the country, and congratulate the board of managers on the financial showing of their year's work.

* * * * *

The annual report of the Commissioner of Navigation for 1896 has just been issued, and it is a pleasure to state that the work in its entirety is a much better epitome of the condition, practical, technical and statistical, of the U. S. merchant marine than we had been prepared to expect from the brief advance report sent out previous to the full publication. The commissioner argues very deftly and logically against any species of cargo carrying discrimination as between American and foreign bottoms, quoting international treaties entered into with about thirty other nations as a bar to the way of such a departure being taken. The subject of registering foreign built vessels and permitting them to fly the stars and stripes when purchased by American citizens is, of course, placed in the most alluring light possible, the Paris and New York, of the old Inman Line, being quoted as a precedent, etc. From a political standpoint and to work in consonance with the views of the administration, the free ship theory is ably advocated and supported by the commissioner, and it is but just to state that, having the courage of his convictions and apparently master of the subject, the plea for foreign built vessels is plausible and the reasoning cogent and logical, as we said before, according to the light of the present administration—but we can't refrain from adding that it won't go; and much as we lean to the commissioners' statement against an unequal and otherwise unjust cargo carrying discrimination, we are decidedly opposed to having foreign shipyards kept busy at the expense of home industries.

The issue of Harper's Weekly dated December 19, will be the special Christmas number. It will contain a strong and picturesque story entitled "The Ghost of Captain Brand," by Howard Pyle, with two full-page drawings and five illustrative headbands by the author. A war-time picture by the late Charles S. Reinhart will illustrate a characteristic story entitled "A Contraband Christmas," by Captain Charles King. W. D. Howells will contribute a "Life and Letters" articles on the subject of Christmas, for which drawings have been made by Edward Penfield. John Kendrick Bangs will write of "The Ghosts that Have Haunted Me," and there will be seasonable drawings by Frederic Remington, A. I. Keller, Peter Newell, Lucius Hitchcock and W. Hatherell.

* * * * *

"The Ship's Company and Other Sea People"—By J. D. Jerrold Kelley, U. S. N. Harper & Bros., New York. In the hands of Lieut. Kelley, the most prosaic details of life at sea are invested with interest and charm by his style. The volume is made up of eight articles about life on the water, aboard the great Atlantic liners, the yachts and men-of-war. These articles are too general in character to have synopses written of them, and their titles may be found in the "contents." The book is profusely illustrated. A few among the most striking passages are: Getting a great ship out of the Liverpool dock; the engine-room and stoke-hold; opening of the yachting season; the regatta; the midshipman as described by Marryat and his life; the boy in the naval academy at Annapolis; the fatality of cats, and the story of Dennis, the pet pig. The "Spirit of Libogen" is a most strange and weird tale, price $2.50.

"Navigation; Practical and Theoretical." By David Wilson-Barker, R. N. R., master mariner, and William Allingham, first-class honors, navigation, science and art department. Price $1.50. J. B. Lippincott Co., Philadelphia. This work of over 150 pages forms the latest of Messrs. Griffin & Co.'s now well-known "Nautical Series of Handbooks," which are edited by Capt. Edward Blackmore. These treatises are designed to meet the growing demand on the part of seamen for a more scientific insight into the principles of their profession. They are for the most part written by sailors for sailors, and while the treatment is thoroughly scientific, the style is such as to render it easy for the seaman to gain a knowledge of his business by private reading and without difficulty. The book, which is clearly printed, is divided into sixteen chapters and an appendix, the first fifteen treating of definitions, latitude and longitude, instruments of navigation, correction of courses, plane sailing, traverse sailing, day's work, parallel sailing, middle latitude sailing, Mercator's chart, Mercator sailing, current sailing, position by bearings, great circle sailing, and the tides; while the sixteenth chapter is devoted to specimen examination papers in navigation, with workings, as set by the Science and Art department. There are numerous illustrations and examples, and the work is indexed. The book is one to be highly commended to the notice of those engaged in sailing.

* * * * *

The best special features offered by any newspaper are always to be found in the Illustrated Buffalo Express. Its holiday issues this year, it is promised, will be an agreeable surprise. If there is any paper in the country that can beat the past successes of the Illustrated Express, that paper is the Illustrated Express itself.

* * * * *

The twelfth annual issue of the Columbia Pad Calendar has made its appearance and, as usual, The Record office has been favored with one. The Pope Manufacturing Co., of Hartford, Conn., evidently find this an excellent advertising medium, or their persistence in publishing what is now considered an office essential would not have been so marked as to carry over a period of twelve issues. In thanking the publishers we can but state for the benefit of our readers by addressing the calendar department, Pope Manufacturing Co., at Hartford, a pad in metal frame will be sent on receipt of five 2-cent stamps.

Messrs. Harper & Brothers published, on December 2, "The Ship's Company, and Other Sea People," by J. D. Jerrold Kelley, Lieutenant-Commander, U. S. N. This gives us glimpses of sea-life ranging from the after-deck of the palatial steam-yacht to the stoke-hold of the ocean greyhound. The author sketches the lotus-eating idlers on the Squadron Cruise in a way that makes us long to be in the composition of his picture; and he is not less interesting in his vivid descriptions of the uninviting phases of the life of the toilers of the sea. He tells us of some of the quaint superstitions of the sailor, and also of the queer pets that endear themselves to Jack's heart. He looks upon ocean life from practically a fresh standpoint, and that's an infallible recipe for making the reader feel that he is face to face with nature. The illustrations are by a score of well-known artists.

* * * * *

"The Engineer in Naval Warfare" is the title of an effective and well considered symposium presented in the opening pages of the North American Review for December. It is intended as a reply to the articles published under a like heading in the Review for May last. In this instance the contributors are: Rear-Admiral John G. Walker, U. S. N.; Captain A. T. Mahan, U. S. N.; Captain R. D. Evans, U. S. N., and Lieutenant S. A. Stanton, U. S. N.

EASTERN FREIGHT MARKET

From the regular freight report furnished the Marine Record by Messrs. Funch, Edge & Co., steamship agents and brokers, New York, it is learned that during the week the volume of business consummated in grain chartering has been smaller than for some time past, especially in full cargoes from the Atlantic ports to Cork for orders; although orders for the latter have again been fairly liberal, the margin for freight has been sufficient to meet the demands of steamship owners, who have shown very little interest in the rates proposed, and are generally holding their vessels for an advance in prices. Rates on the berth appear neglected, and their downward tendency is affected by the speculative engagements of room on the part of our shippers entered into at much higher figures, and which now must be provided for on the best obtainable terms. There is a fair inquiry for steamers to load timber from the best obtainable terms. There is a fair inquiry for steamers to load timber from the Gulf ports, but at the moment owners do not appear disposed to consider such occupation at anything like the figures proposed by intending charterers.

The demand for sail tonnage has been light, and limited mainly to spot and nearby vessels, rates for which continue fairly firm. There is very little inquiry, however, for distant loading, and, with rates in favor of shippers, they are holding back in the expectation of eventually securing tonnage at lower figures. Case oil freights to the far east are decidedly easier, and, with plenty of room offering, a further decline does not appear improbable, whilst for barrel oil to Europe there is no demand whatever, excepting for prompt shipment. In all other branches our market has been remarkably quiet and but little has been accomplished.

The scarcity of manilla rope in consequence of the trouble in Phillipine Islands, has materially increased its price. Improvements, however, in the manufacture of steel rope have been made, and it is claimed that it now holds an equal rank with former.

PROPOSALS.

U. S. Engineer Office, Duluth, Minn., Dec. 14, 1896. Sealed proposals, in triplicate, for building breakwater at Presque Isle Point, Marquette, Mich., will be received here until noon, Jan. 11, 1897, and then publicly opened. Information furnished on application. Clinton B. Sears, Major Engrs.

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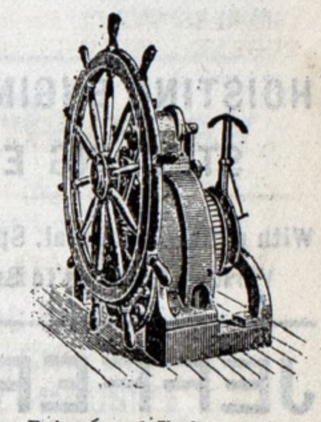

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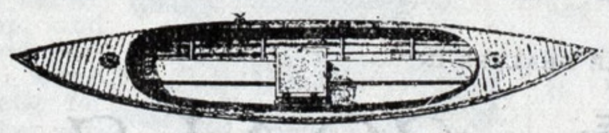

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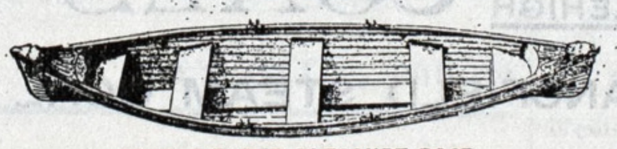

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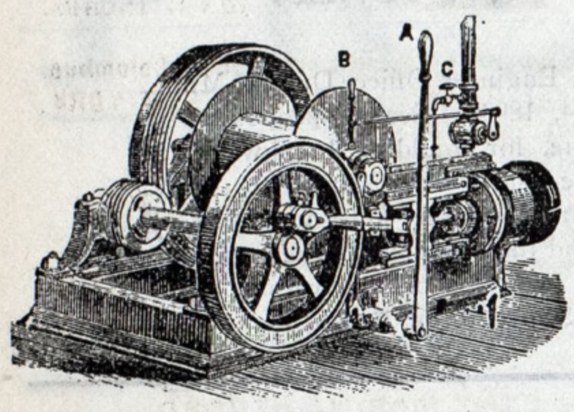

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MANUFACTURERS OF

Marine and Stationary Engines

AND BOILERS OF ALL KINDS.

Heavy Castings a Specialty. Prices Quoted on Application.

Fore and Aft Compound Marine Engines.

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Tug, Hunter, Chicago, 15 and 28x22.
Tug, Tacoma, Chicago, 16 and 30x24.
Tug, Zenith, Duluth, 18 and 36x30.
Steamer Glenn, South Haven, 14 and 28x20.
U. S Survey Steamer, W. S. Hancock 12 and 21x20.
Steamer Pine Lake, Charlevoix, 16 and 30x24.
Passenger Steamer Pilgrim, St. Clair, 14 and 28x20.
Steam Barge Iona, Grand Haven, 24 and 46x42.
Steam Barge M. T. Greene, Chicago, 20 and 36x36.
Steamer H. W. Williams, South Haven, 18 and 36x30.
Steam Barge Mark B. Covell, Manistee, 18 and 30x26.
Steam Barge Isabella J. Boyce, Michigan City, 19 and 32x26.
Steam Barge Luella H. Worthington, Cedar River, 19 and 36x30.
Passenger Steamer City of Kalamazoo, South Haven, 20 and 40x30.
Steamer Oval Agitator, Chicago, 14 and 28x20.
Tug E. G. Crosby, Muskegon, 16 and 30x24.
Tug Peter Coates, Sault Ste. Marie, 10 and 20x16.
Steamer Lorain L, South Haven, 12 and 21x16.
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Steam Barge Sachem, Grand Haven, 21 and 38x36.
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Steam Barge Edward Buckley, Manistee, 18 and 36x30
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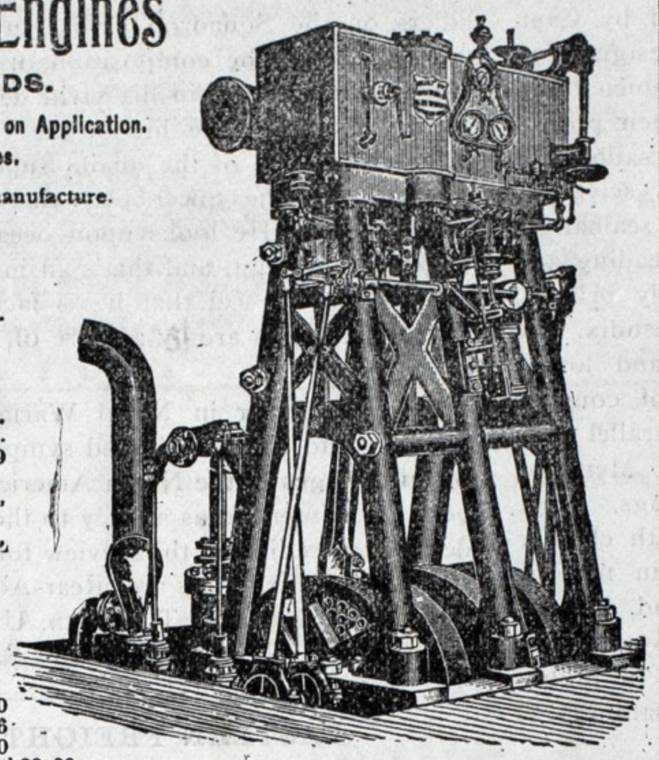
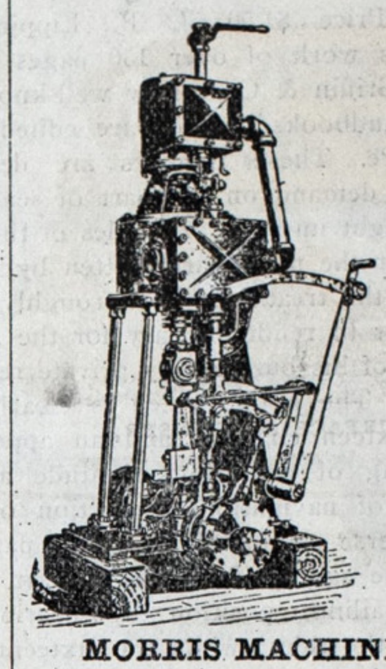


The engraving represents our 20 and 36x36 Fore and Aft Compound Marine Engine. We build them all sizes and guarantee them to give satisfaction. Prices furnished on application.

MONTAGUE IRON WORKS CO., Montague, Mich.

MARINE ENGINES



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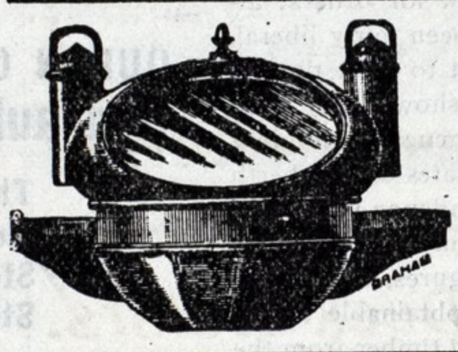

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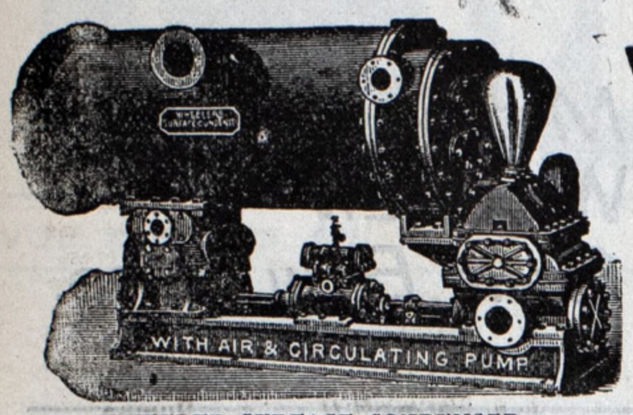

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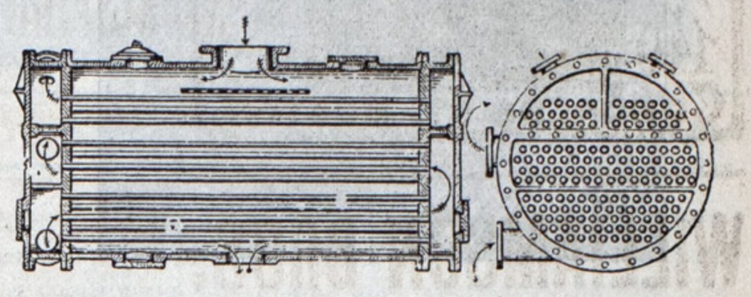

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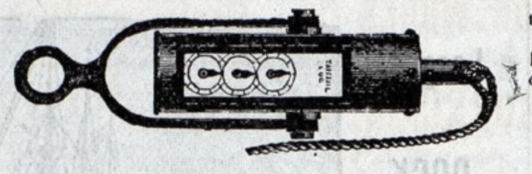

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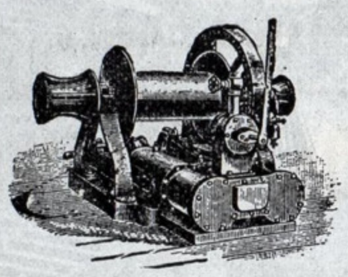

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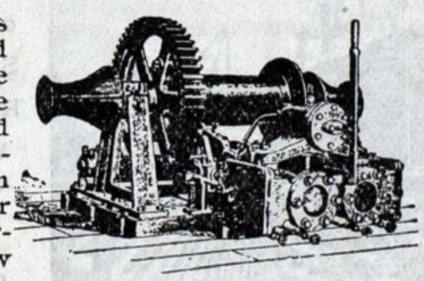

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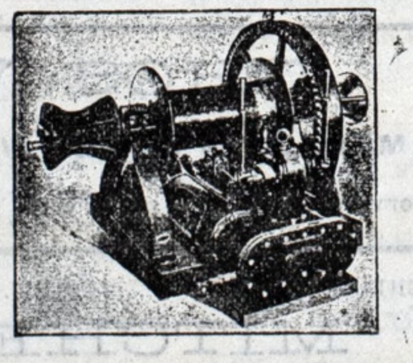

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OFFICE OF THE LIGHT-HOUSE BOARD, Washington, D. C., December 1, 1896. Sealed proposals will be received at this office until Wednesday, the 30th day of December, 1896, for furnishing the materials and labor of all kinds necessary for the construction, equipment and delivery of three first-class composite light-vessels and two steam tenders. Bids will be received for each vessel or class of vessel separately, or for all five of the vessels, all to be delivered on the Atlantic coast. An alternate bid will be received for one of the three light-vessels, to be delivered at San Francisco, Cal. The said vessel or vessels must be completed and delivered within ten calendar months from date of the approval of the contract by the Secretary of the Treasury, and bidders are informed that because of the urgent need of the speedy delivery, the element of time to be consumed in construction will be given due consideration in determining the award of the contract, and in each case the contract will be awarded to the lowest best responsible bidder. Each proposal must be accompanied with a certified check payable to the order of the Secretary of the Treasury, in the sum of five thousand dollars ($5,000). The certified check of the succetsful bidder will be retained until the execution of a formal bond or contract, and the approval of the same by the Secretary of the Treasury, and the certified checks of the unsuccessful bidders will be returned immediately after the proposals of the successful bidder have been accepted. Forms of proposals, plans and specifications showing what is required, can be had or seen by applying to this office. The right is reserved to reject any or all bids and to waive any defects. JOHN G. WALKER, Rear Admiral, U. S. N., Chairman.

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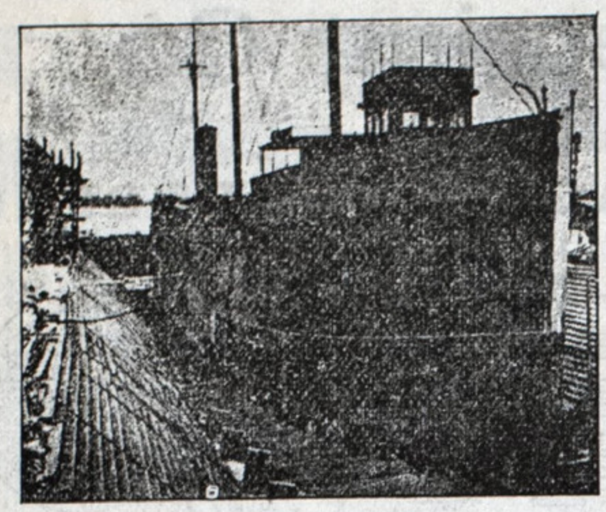

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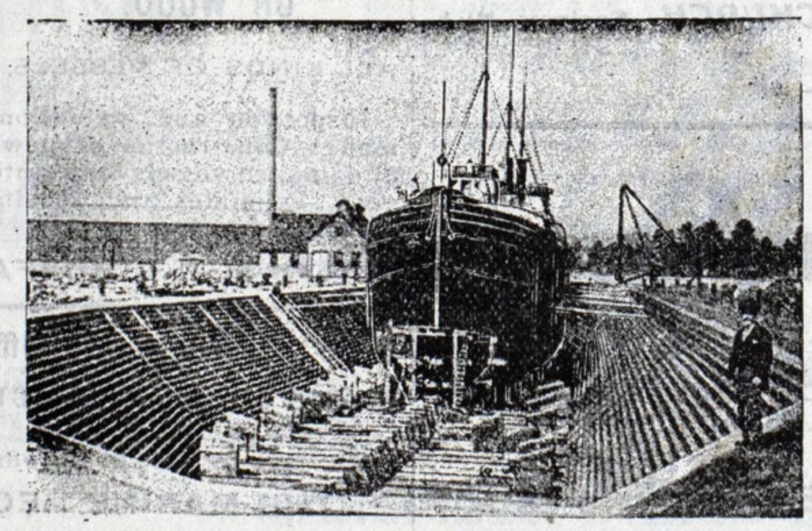

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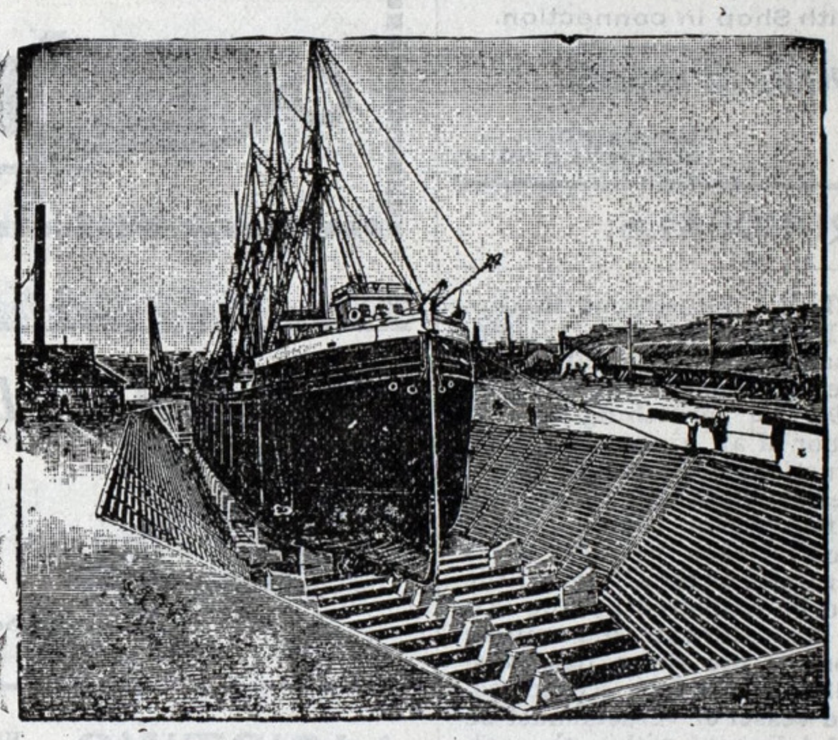

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